

ITER

United States Rejoins International Fusion-Research Project

PRINCETON, NEW JERSEY—In, then out, then in again. In 1998, the United States withdrew from a previous incarnation of the \$5 billion International Thermonuclear Experimental Reactor (ITER) experiment, which will use a doughnut-shaped magnetic bottle to confine a superhot hydrogen plasma and induce it to undergo nuclear fusion. But last week, Secretary of Energy Spencer Abraham announced that the United States would seek to become a partner in ITER again, as part of its push for long-term energy independence.

“I am pleased to announce today that President Bush has decided that the United States will join the international negotiations on ITER,” the secretary told dignitaries and plasma physicists gathered at the Princeton Plasma Physics Laboratory (PPPL).

Other ITER partners greeted the announcement with enthusiasm. “ITER is supposed to be an international project, and this makes it truly international,” says Satoru Ohtake, head of the Office of Fusion Energy at Japan’s Ministry of Education, Culture, Sports, Science, and Technology, whose

looming costs, declining budgets, and scientific doubts about the magnetic bottle’s design. The remaining partners forged ahead on their own, redesigning the proposed experiment to make it considerably smaller and half as expensive. Since then, they’ve picked up commitments from Canada and China, along with an expression of interest from South Korea.

“Something has changed” to bring the United States on board, says Ray Orbach, head of the Department of Energy’s (DOE’s) Office of Science. For one thing, most physicists now think the technology is mature. “Simulations, done here [at PPPL] for example, have given us confidence that ITER will work,” Orbach says. Ned Sauthoff, a plasma physicist at PPPL, agrees. “I am more confident because there is much more consensus within the scientific community,” he says, adding that some of the design flaws of the original ITER had been fixed.

Fusion research also meshes well with the Bush Administration’s broader energy goals. For example, fusion plants might someday provide the power needed to turn water into hydrogen to fuel cars—part of the president’s vision of a hydrogen-based economy.

The Administration had been dropping hints for months that it would be interested in pursuing fusion-power research. In May 2002, Abraham asked DOE “to seriously consider American participation” in ITER (*Science*, 10 May 2002, p. 999), and in July a gathering of fusion physicists concluded that there was a pressing need for a burning-plasma experiment such as ITER.

In September, DOE’s Fusion Energy Sciences Advisory Committee (FESAC) proposed a two-pronged approach that included entering ITER negotiations (*Science*, 20 September 2002, p. 1977). And in December, the National Research Council released an interim report that also recommended the government rejoin ITER talks.

So did five members of the House Science Committee, including the chair, Sherwood Boehlert (R-NY). In a letter sent to DOE last week, they urged Abraham “to send a clear message to the ITER community that the U.S. plans to participate in ▶



Power play. Secretary of Energy Spencer Abraham (center) and other officials inspect Princeton’s plasma-physics lab.

country is contributing to the international bid. “If the [U.S.] president and the secretary of energy make it public, we can all be sure that they are committed, and we are happy,” says Bernd Kramer, head of the Science, Technology, and Environment division of the German Embassy in Washington, D.C.

Conceived in 1986 as a massive research effort to pave the way for practical fusion power, ITER began with four equal partners: Japan, the Soviet Union, Europe, and the United States. Congress pulled the U.S. out of the project in 1998, amid bal-

India Gives Agricultural Research a Makeover

NEW DELHI—India is revamping its highly centralized agricultural research enterprise to give local and regional officials greater authority. The government says the changes, which are based on recommendations from a report delivered last week to the agriculture minister, reflect a need to improve food quality and safety now that the country is able to feed its population.

Some 6300 scientists work for the \$375 million Indian Council of Agricultural Research (ICAR), whose 170 research entities are tightly managed by its headquarters in New Delhi. ICAR will close or merge several institutes while creating a national biotechnology institute to spread rapidly developing technology. Mangala Rai, the council’s newly appointed director general, calls the changes “very positive and implementable.”



—PALLAVA BAGLA

Italy Reportedly Fires Research Chief in Reform Sweep

NAPLES—The Italian government is moving quickly to implement radical new reforms in its National Research Council (CNR). Italy’s Council of Ministers last week approved a long-awaited decree that would, among other changes, allow the Ministry of Education, Universities, and Research to appoint new directors of CNR’s 108 institutes and merge four research institutes. In response, the president of one institute slated for merger—condensed-matter physicist Flavio Toigo of the National Institute for the Physics of Matter in Genoa—has already tendered his resignation.

He’s not the only victim of the reforms. Earlier this week, newspapers reported the dismissal of CNR president Lucio Bianco. As a temporary replacement, science minister Letizia Moratti plans to appoint Adriano De Maio, an electronics engineer and rector of Luiss Guido Carli University in Rome. Bianco says he has not been officially notified of his dismissal and is evaluating whether to take legal action. But Giovanni Grimaldi of the CNR Institute for Genetics and Biophysics in Naples promises that “if Bianco does not take legal action, we will.”

—ALEXANDER HELLEMANS

CREDITS: (TOP TO BOTTOM) P. BAGLA, PPPL

the negotiations and the subsequent design, construction, and operation of the facility.”

Abraham plans to represent the United States at a meeting that the ITER partners are holding later this month in St. Petersburg, Russia, where the intricate negotiations will continue. But the details of U.S. participation remain unclear. Observers expect the United States to match China's recent promise to contribute 10% of the overall costs, a figure that Murray Stewart of ITER Canada calls “the minimum requirement.” According to a FESAC report presented last September, such a share represents an additional investment of about

\$100 million per year for nearly a decade. So far, however, Abraham has pledged only about \$50 million a year over the same time period (see p. 807).

In his announcement at Princeton, Abraham stressed that the United States will maintain a strong domestic fusion program as well. “Our decision to join ITER in no way means a lesser role for the fusion programs we undertake here at home,” he said, adding that this nation must “maintain and enhance” its domestic fusion research. It remains to be seen how the \$257 million DOE fusion-energy sciences budget will be expanded and redistributed to make room for

ITER on top of domestic fusion-research activities, such as the PPPL-based Fusion Ignition Research Experiment. “It's not [as if] money will come down like manna from heaven,” says PPPL deputy director Richard Hawryluk. “But I'm very excited.”

This week's presidential budget request (see p. 806) doesn't contain any new money in 2004 for fusion research. But Abraham said that he expects the budget ramp-up to “move pretty quickly” as the 2006 construction date approaches. That number is the acid test, say ITER supporters, of whether the U.S. plans to fuse or to refuse. —CHARLES SEIFE

With reporting by Dennis Normile.

FORESTRY

Old-Growth Forest Spared for Now

Forest scientists won a victory of sorts last month when Mexican officials agreed to postpone logging in a rare forest ecosystem in Baja California. A delegation of four American scientists visited Mexicali, the state capital, on 20 January to plead for the preservation of what one calls “the only pris-

times as big, on average, as those in similar U.S. forests. For scientists, the forest is a living fossil and a possible guide for restoring other forests to a more natural state.

In the 1990s, the government allowed communally owned lands called ejidos near the San Pedro Martír National Park to be sold; this led to consolidation of nearby forested property. Some owners applied for logging permits. The case for logging outside and possibly inside the park was strengthened in 2002 by the worst drought in modern memory. It raised concerns that the forest was in danger of a catastrophic fire or an infestation of beetles, which target drought-weakened trees.

Ecologist Ernesto Franco of the Centro de Investigación Científica y de Educación

Superior, in Ensenada, started hearing rumors earlier this year about a “sanitation harvest” in the forest. Only later did he get the details: The federal Ministry of the Environment ordered Baja landowners to remove dying trees within 120 days. Franco, who has fought attempts to log the forest for about 15 years, promptly contacted four U.S. colleagues who have conducted research in the forest and arranged a meeting with state and federal officials. The U.S. scientists loaded up their slide carousels and headed south.

Entomologist emeritus Pat Shea of the U.S. Department of Agriculture Forest Service in Davis, California, presented evidence

that the forest's low tree density prevents major bark beetle damage and would protect it during the current drought. Biogeographer Richard Minnich of the University of California (UC), Riverside, drew on data from aerial photographs to show that fire has always removed dead material from the ecosystem. He acknowledges that the forest has seen unprecedented tree death from the drought, but he says it is not as bad as in U.S. forests, where thousands of trees are dying in groups. Forest scientist Scott Stephens of UC Berkeley presented tree-ring data supporting the historic importance of fire.

“What [the Mexican officials] came away with from the meeting was that [the] system really is a jewel,” Stephens says. “It's hard to realize that sometimes inaction or careful monitoring is the best action.”

Partly as a result of the scientists' presentations, the state-level Ministry for Agricultural Development has asked for the sanitation order to be postponed. “We don't want to do something that can damage more than it can help,” says Angel Pineda, forest coordinator for the ministry. The scientists “made us think that there could be other solutions to our problem.” Martín García, the Baja delegate for the Environment Ministry, says that state and federal agencies are studying the situation and could decide by mid-February whether to allow logging.

Whatever the decision, it will immediately affect ejidos that contain 2000 hectares of forest, including a California condor reintroduction site, surrounding the 50,000-hectare park. But the scientists hope their actions will benefit the park as well. “The whole concern was that the ejidos would pressure the national park to start giving in on the edge,” and that loggers “could just start wandering” inside, Shea says. “I don't think that's going to happen now.” —BEN SHOUSE

Ben Shouse is a writer in Santa Cruz, California.

With reporting by Jocelyn Kaiser.



Burn, baby, burn. Fire thins the forest in San Pedro Martír National Park, keeping it resistant to insects and disease. Scientists say logging would disrupt the ecosystem's balance.

tine conifer forest in North America.” Despite the reprieve, the group says archaic laws and the influence of landowners still threaten the forest.

Dry summers, granite outcrops, and butterscotch-scented Jeffrey pines make the San Pedro Martír mountains seem like a misplaced piece of California jutting out of the desert. But this remote region of Mexico has not been commercially logged; it has also escaped the fire suppression that made U.S. forests pathologically dense and prone to catastrophic fires. Natural burns keep the forest floor open and give surviving conifers plenty of room to spread their branches. The trees are about a third as dense and three